REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	JUNE 1996	FINAL REPORT (07-95 TO 07-96)

4. TITLE AND SUBTITLE

THE DECISION-MAKING PROCESS FOR THE PROVISION OF AMBULANCE SERVICE AT KIMBROUGH AMBULATORY CARE CENTER

5. FUNDING NUMBERS

6. AUTHOR(S)

CPT TAMARA J. FREEMAN, MS, CHE

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

KIMBROUGH ARMY COMMUNITY HOSPITAL
FORT GEORGE G. MEADE, MD

8. PERFORMING ORGANIZATION REPORT NUMBER

20a-96

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

US ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL
BLDG 2841 MCCS-HRA US ARMY-BAYLOR PROGRAM IN HC
3151 SCOTT RD
FORT SAM HOUSTON TX 78234-6135

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

The 1995 Base Closure and Realignment Commission legislation required Kimbrough Army Community Hospital to close its inpatient services and realign as an outpatient clinic. This further implied that Kimbrough must close its emergency room. The realignment also required the hospital to downsize by 128 personnel authorizations. Kimbrough responded by redesigning its organization into a more efficient and customer-focused structure and "trimming the fat" wherever possible and appropriate. Because of the inpatient services and emergency closures, demand for ambulance services was projected to decline. Therefore, the ambulance section was identified as a functional area that could continue to operate efficiently with less resources. Various alternative solutions for the delivery of ambulance service were developed after researching the literature and studying similar organizations. Six alternatives were selected for consideration. The alternatives chosen included variations such as adjustments to the current staffing and equipment levels, contracting for a portion of ambulance coverage, and transferring the ambulance function to the post fire department. The six alternatives were evaluated by examining the criteria of response time, cost, and 0198 Table of Distribution and Allowances authorizations and comparing the scores obtained for these criteria. After applying the six courses of action to a decision-making matrix, the alternate of transferring the ambulance function to the post fire department achieved the highest score and emerged as the best course of action. Therefore, the decision to transfer the ambulance function to the post fire department was recommended and eventually approved by all the stakeholders involved in t he decision.

14. SUBJECT TERMS

AMBULATORY CARE CENTER, DOD EMS REQUIREMENTS

15. NUMBER OF PAGES
67

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
N/A	N/A	N/A	UL

U. S. ARMY-BAYLOR UNIVERSITY

GRADUATE PROGRAM IN HEALTH CARE ADMINISTRATION

THE DECISION-MAKING PROCESS FOR THE PROVISION OF AMBULANCE SERVICE AT KIMBROUGH AMBULATORY CARE CENTER

A GRADUATE MANAGEMENT PROJECT

SUBMITTED TO MAJOR DAVID HEIER, M.H.A., CHE

AND MAJOR DERICK B. ZIEGLER, M.H.A., CHE

IN PARTIAL FULFILLMENT FOR A

MASTERS DEGREE IN HEALTH CARE ADMINISTRATION

BY

CAPTAIN TAMARA J. FREEMAN, CHE

FORT GEORGE G. MEADE, MD

JUNE 21, 1996

ABSTRACT

The 1995 Base Closure and Realignment Commission legislation required Kimbrough Army Community Hospital to close its inpatient services and realign as an outpatient clinic. This further implied that Kimbrough must close its emergency room. The realignment also required the hospital to downsize by 128 personnel authorizations. Kimbrough responded by redesigning its organization into a more efficient and customer-focused structure and "trimming the fat" wherever possible and appropriate. Because of the inpatient services and emergency room closures, demand for ambulance services was projected to decline. Therefore, the ambulance section was identified as a functional area that could continue to operate efficiently with less resources. Various alternative solutions for the delivery of ambulance service were developed after researching the literature and studying similar organizations. Six alternatives were selected for consideration. The alternatives chosen included variations such as adjustments to the current staffing and equipment levels, contracting for a portion of ambulance coverage, and transferring the ambulance function to the post fire department. The six alternatives were evaluated by examining the criteria of response time, cost, and 0198 Table of Distribution and Allowances authorizations and comparing the scores obtained for these criteria. After applying the six courses of action to a decision-making matrix, the alternative of transferring the ambulance function to the post fire department achieved the highest score and emerged as the best course of action. Therefore, the decision to transfer the ambulance function to the post fire department was recommended and eventually approved by all the stakeholders involved in the decision.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Conditions Which Prompted the Study

According to Pentagon officials, the military drawdown -- which has cut the active-duty force by 700,000 members, or more than 26 percent -- is breathing its last, fitful gasps. Officially, the drawdown will continue until 1999, when the services reach the 1.45-million-member active-duty total of the bottom-up review (Hudson 1995). More than six years after it started the biggest force reduction campaign since the end of the Vietnam war, the Army is just a few thousand soldiers shy of its post-drawdown endstate of 495,000. The Army's most recent manpower statistics show that its active-duty component numbered 508,764 members on September 30th, the last day of fiscal year 1995. Since the end of Operation Desert Storm in 1991, the Army has been cut by 201,200 soldiers, or about 28 percent. The reductions are scheduled to stop this coming September 30 when the Army reaches its post-drawdown goal of 495,000 soldiers. The force reduction plan, which had called for a population cut of 15,000 soldiers in fiscal 1996, is running ahead of schedule (Tice 1996). The Department of Defense's (DoD) budget has also shrunk. From fiscal year 1985 to 1997, in real terms overall Defense spending has declined by 40 percent (DoD 1995).

Given the post-Cold War reductions in the military budget and the size of the armed forces, base closings have become a critical issue. Unless the infrastructure is downsized commensurately with the force structure and budget, funds will be spent on

maintaining unneeded installations and buildings instead of readiness and personnel. For many years, however, DoD found the opposition to closing domestic bases to be too powerful. In the decade before the first Base Closure and Realignment Commission (BRAC), only four bases could be closed (DoD 1995). In the late 1980's, members of Congress concluded that the only way to overcome the opposition of its members to individual closings was to entrust the process to an independent commission. The first BRAC Commission was created by statute in 1988 (Summers 1995). Public Law 101-510 requires the Secretary of Defense to submit a list of proposed military base closures and realignments to the Commission. The BRAC Commission considers the base-closing and realigning recommendations submitted by DoD and makes its own evaluation of those that should be shut down or realigned. The Commission votes on the recommendations and then submits a list to the President and Congress for approval. Under the BRAC law, the President must reject the recommendations or forward the entire package to the Congress. The legislature can accept or reject the package but cannot tinker with the parts. So far, three rounds of base closings have been conducted. In the most recent round, the BRAC list was voted on by the Commission on June 22, 1995, and has since been approved by the president and Congress (Nelson 1995).

For BRAC 95, the Deputy Secretary of Defense created Joint Cross-Service Groups (JCSGs) encompassing five different functional areas to consider potential joint or common activities among the military departments. One of the five functional areas considered was medical treatment. The Joint Cross-Service Group on Medical Treatment (JCSG-MT) recommended that Kimbrough Army Community Hospital (KACH), a

Medical Treatment Facility (MTF) located at Fort George G. Meade, Maryland, eliminate inpatient services and realign to a clinic. The JCSG-MT's justification for this recommendation is the realignment will eliminate excess medical treatment capacity at Fort Meade by eliminating inpatient services. The JCSG-MT further explained that inpatient care would be provided by other area military hospitals and private hospitals and facilities through Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) (DoD 1995). The BRAC Commission concluded in their report to the President that although this realignment would reduce costs and save the government money, the Commission recognized the realignment would inconvenience some of the current KACH beneficiaries. Despite this acknowledgment, the Commission concurred with the JCSG-MT's recommendation and forwarded it in their report to the President (BRAC 1995). The requirement for KACH to realign to a clinic was included in the BRAC 95 legislation. Although the legislation specified KACH realign to a clinic, it mentioned nothing about the projected size or mission of the clinic.

Presently, KACH staffs and operates 22 beds (18 medical/surgical beds and four intensive care unit beds). KACH offers a Level II emergency room (ER), comprehensive primary care, selected specialty care, and same day surgery. KACH also serves as the command and control headquarters for Kimbrough and eight outlying clinics in Maryland and Pennsylvania. The current organizational structure is shown in Figure 1. There are currently 39 physicians, 41 registered nurses (RN) and certified registered nurse anesthetists (CRNA), 195 direct care paraprofessionals, and 200 administrative and clerical support personnel working at Kimbrough, comprising a total of 475 personnel.

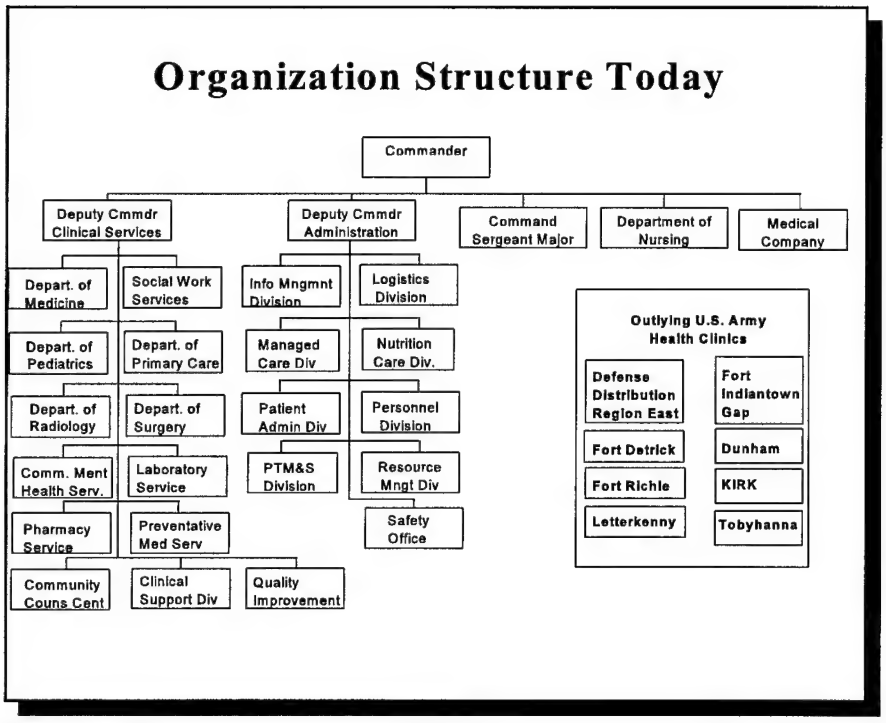

Figure 1

Descriptions of the current and projected beneficiaries in Kimbrough's catchment area are shown in Figures 2 through 5.

In fiscal year 1995 (FY95), Kimbrough's average daily patient load was nine, the average daily operating room (OR) procedures was seven, the average daily outpatient visits was 1,068, and the average daily ER visits was 69.

The BRAC recommendation regarding KACH requires the MTF to eliminate inpatient services and reduce to a clinic. This further implies that Kimbrough will close its ER because a medical facility cannot operate an ER unless it has inpatient services (JCAHO 1996). Instead of an ER, KACH will operate an Acute/Minor Illness Clinic (AMIC) which will provide care for many of the patients who currently use the ER for non-emergency illnesses and injuries.

Although KACH will no longer provide inpatient services, its post-BRAC mission will still be quite substantial and not all that different from its current mission.

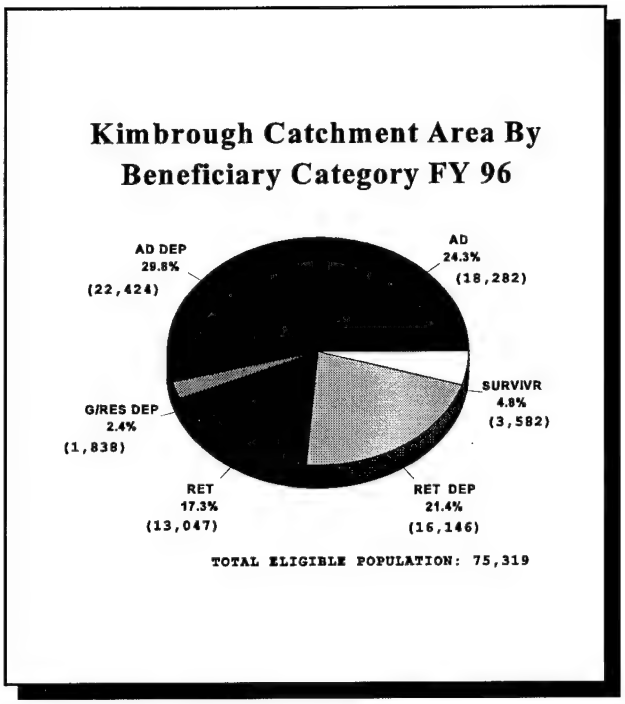

Figure 2

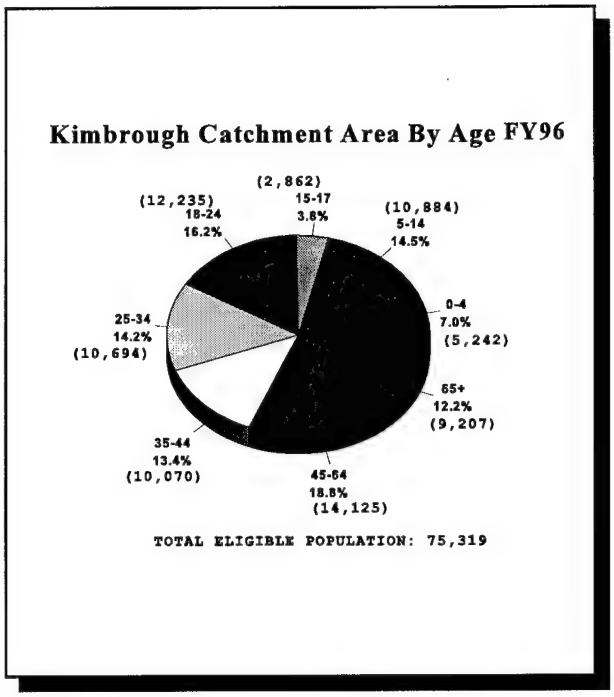

Figure 3

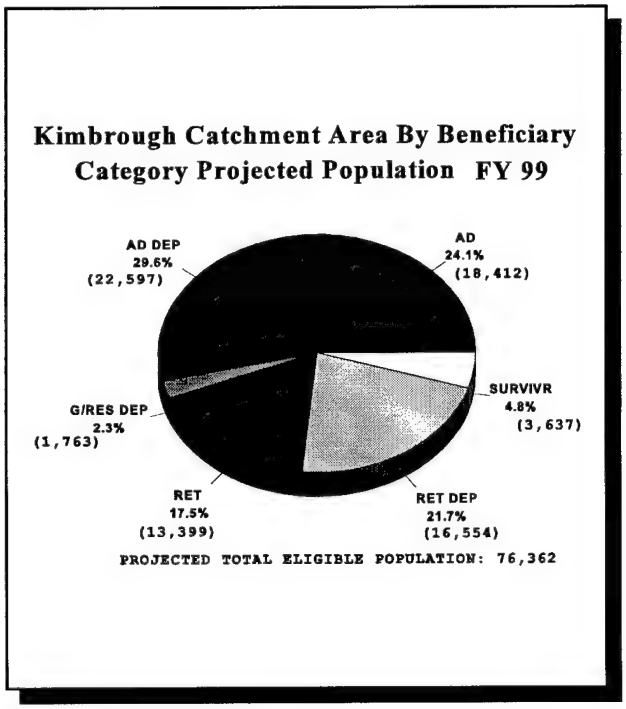

Figure 4

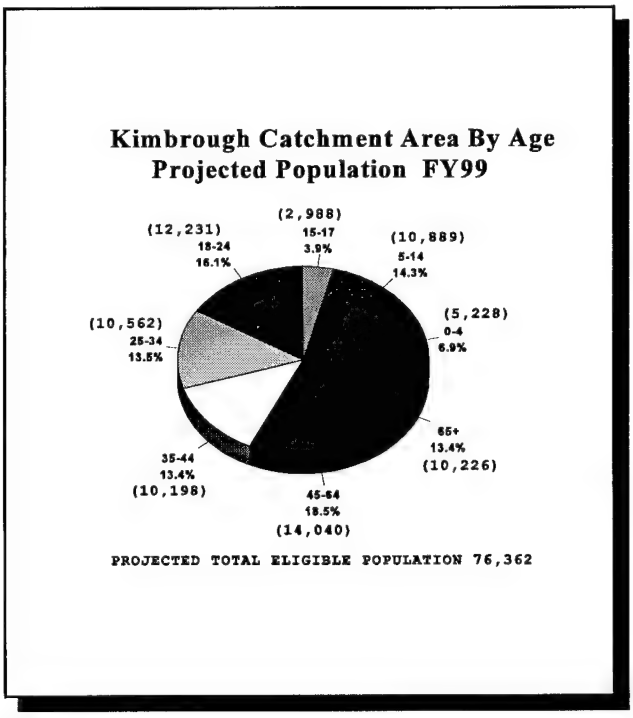

Figure 5

For example, by studying the description of KACH's current workload, it can easily be determined that the hospital's emphasis is already on outpatient care. The inpatient care provided and the workload it generates is small in comparison to the outpatient care and workload. More than half of the OR procedures are same day or ambulatory surgery. Accordingly, perhaps the transition from a hospital to a large outpatient clinic isn't as traumatic or drastic as it might seem at first glance. Therefore, the most significant impact of implementing the BRAC decision will be the out of pocket costs KACH's beneficiaries will be required to pay for civilian ER and inpatient care which KACH will no longer be able to provide.

The post-BRAC mission calls for KACH to be a vital member of the Walter Reed Health Care System, to operate an Ambulatory Surgical Center under the new name of Kimbrough Ambulatory Care Center (KACC), and to remain the Command and Control Headquarters for Kimbrough and six of the eight outlying clinics (two clinics will be closing due to BRAC legislation). Kimbrough will continue to provide the following functions and services: comprehensive primary care, utilization management, an acute care clinic, ambulance service, same day (ambulatory) surgery, selected specialty services, diagnostic and treatment services, and preventive medicine services (KACH 1995).

In keeping with BRAC legislation, along with the reduction from a hospital to a clinic and the resulting reduction in functions comes a mandatory reduction in manpower. Specifically, KACH will lose 128 authorizations (71 civilian and 57 military), going from a staffing level of 475 authorizations to 347 authorizations. Technically, half of the

BRAC civilian workyear reductions must be taken in FY96 and the other half in FY97. The military reductions must be taken between now and the end of FY97. Although not all the reductions must be taken immediately, Kimbrough will no longer have the staff necessary to operate as an inpatient facility as of 30 September 1996. Furthermore, in order to manage the FY97 operating budget appropriately, the personnel associated with the FY97 workyear reductions must be "off the books" by the end of FY96 or the beginning of FY97. This requires a civilian personnel reduction in force (RIF) be conducted and completed by September 30, 1996. In response to these requirements, Kimbrough developed a Medical Services Action Plan (MSAP) which reflects the exact structure of the organization and the services it will provide after the reduction of 128 authorizations. The MSAP has been approved by the U. S. Army Medical Command (MEDCOM) for implementation.

In recent years, the military has attempted to restructure organizations and redesign work processes in its efforts to successfully meet the challenge of downsizing and realignments. The phrases "doing more with less", "innovative thinking", "cost-efficiency", "thinking outside of the box", "total quality management", and "process action teams" have become commonplace and are the ideas and principles employed by today's managers when faced with making tough decisions involving scarce resources. These same ideas and principles guided the managers involved with the development of KACH's MSAP. A new organizational structure was developed under a work-redesign effort initiated to align functions and services in a more efficient and patient-focused manner (Figure 6).

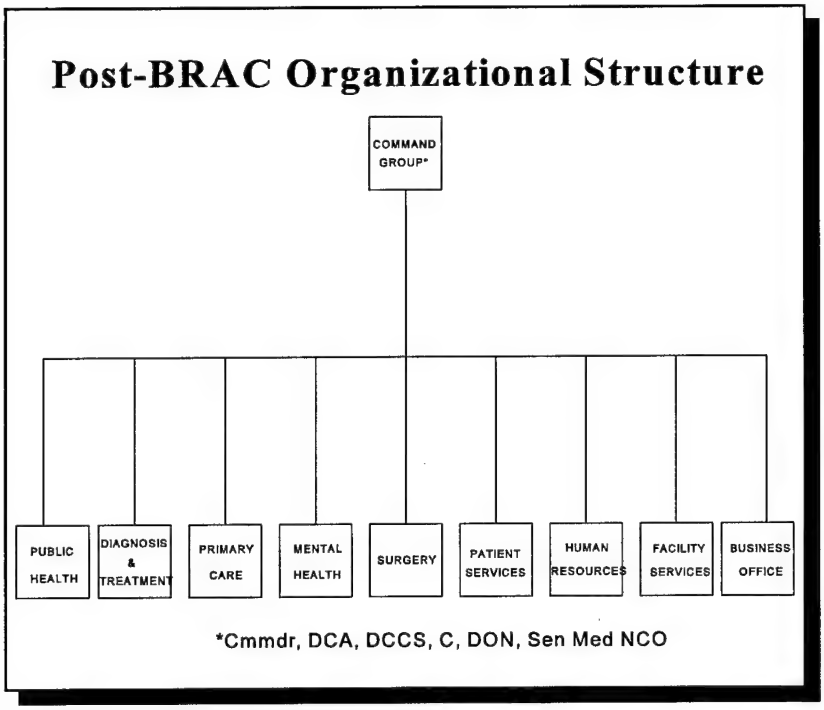

Figure 6

During the planning process, Kimbrough projected the specific staffing levels within the various functional areas in order to determine where reduction in authorizations would be most appropriate. Kimbrough made these projections based on the change in mission and the change in methods of patient care delivery. In an effort to minimize inconveniences to customers, the decisions made during the development of the post-BRAC organizational structure and MSAP were done so with the intent of maintaining and continuing to provide as many services as possible and appropriate. The MSAP and draft 0198 Table of Distribution and Allowances (TDA) called for the reduction of the KACH ambulance section from 16 authorizations to seven in accordance with the new mission. This reduction was based on two considerations: (1) the assumption that the elimination of inpatient services and ER would cause a subsequent decline in demand for ambulance services; and (2) the current ambulance section's equipment and staffing level of two paramedic or Advanced Life Support (ALS) units with two-man crews, 24-hours per day,

seven days a week appeared to be excessive when compared to the needs of the hospital and on-post community.

However, the KACH ambulance section is the primary emergency medical services (EMS) responder for the entire post. This is a crucial factor which must be carefully considered during the planning process for future ambulance service. Furthermore, several ambulance personnel contacted both television and newspaper media in an attempt to fight the new 0198 TDA organizational structure. During their interviews, the ambulance personnel expressed their personal opinions that KACH was compromising patients by reducing the ambulance section staff. Additionally, an inflammatory letter blasting KACH's decision to reduce EMS personnel was anonymously mailed to all families in the exceptional family member program (EFMP) (Appendix A). The community reacted with alarm to the negative media coverage and the EFMP letters. KACH's Commander and Deputy Commander for Administration held a press conference to assuage the community's fears and reassure them that adequate EMS would continue to be provided.

Obviously, the life safety and total patient care issues that a change in the ambulance service present are significant and warrant further research and analysis. In order to determine the most appropriate method of providing this service in conjunction with achieving the post-BRAC reductions, a complete decision-making process is necessary. Additionally, in light of the recent media attention and community focus on this matter, the decision that is eventually attained and implemented must be arrived at through a thoroughly researched and objective process. The need for a timely decision

and the critical impact the outcome will have on both KACH and the community prompted this study.

Statement of the Problem

I will investigate various methods for the delivery of ambulance services. The stated research problem is: Determine from various courses of action (COAs) the best and most appropriate method of providing ambulance service for Kimbrough Ambulatory Care Clinic and the Fort George G. Meade workforce and residential population.

Literature Review

To develop various and appropriate COAs, I conducted indepth research on the Emergency Medical Systems within the DoD, U.S. Army, U.S. Army Medical Department (AMEDD), and the state of Maryland. I researched information about EMS certification and training requirements, EMS equipment requirements, typical EMS staffing models, and response times in order to educate myself on the standards of care relating to EMS and ambulance services. Furthermore, I collected and evaluated as much information as possible regarding organizations similar to KACH and those organizations that have dealt with similar realignment and downsizing issues. Possible COAs and solutions were obtained by examining similar organizations and the methods they devised to cope with downsizing while still providing ambulance service. However, before any option was considered and evaluated as a COA, it had to meet the appropriate regulatory requirements for certain certification, training, equipment, staffing and response time standards of care.

Department of Defense EMS Requirements

First and foremost, my research efforts focused on establishing an understanding of the DoD, U.S. Army, and AMEDD requirements regarding the provision of ambulance services and EMS as they apply to KACH. Does KACH still have a requirement to provide this service once it is no longer a hospital with inpatient wards and an ER? According to the Health Services Command (HSC) Regulation 40-5, Medical Services Ambulatory Patient Care, "Each *inpatient facility* will maintain an EMS designated by the medical activity (MEDDAC) commander at the appropriate JCAHO level. The designated level will be consistent with the personnel, equipment, and physical plant resources of the facility or MEDDAC. If there is a need to raise or lower the existing level of EMS provided, such a change will be compatible with the health service region's goal of providing total health care." (HSC 1993). In researching the JCAHO Standards, there is no requirement for a health clinic to provide EMS or ambulance services. Therefore, it can be concluded from this regulation that an *outpatient* health clinic has no requirement to provide EMS or ambulance services. However, because of his concerns regarding life safety issues, as well as keeping good faith with the community and KACH's customers, the commander felt compelled to continue to provide this service.

As a result, it was essential for me to determine the various methods of providing EMS and ambulance services that could be supported by the regulations. Again, HSC Regulation 40-5 provided the needed guidance by stating "Facilities not offering in-house ambulance service will have a documented mechanism for transport of emergency

patients" (HSC 1993). The regulation stipulates that not all facilities provide this service, but all facilities must have a documented mechanism for the transport of emergency patients. This was a starting point from which I could begin to develop alternative methods of providing ambulance service.

Among the myriad of alternative methods that could be considered, one option is reducing the current level of staffing for KACH's ambulance section. The regulation supports this alternative by stating "Each MTF ambulance section must have two fully equipped and fully staffed ambulances available 24 hours a day, seven days per week. If a facility, as determined by the MTF commander, *is unable to provide the second (backup) ambulance crew*, there will be health service region coordination to ensure continuity of service." (HSC 1993). The regulation verifies that DoD recognizes not all MTF's will be able to staff two ambulances. This fact is accepted as long as there is adequate coordination for that backup.

According to the *EMS Systems Program Guidelines*, each EMS system must provide for the establishment of appropriate arrangements with other EMS systems or similar entities serving neighboring areas for the provision of emergency services on a reciprocal basis where access to such services would be more appropriate and effective in terms of the services available, time, and distance (DHEW 1979). Most of the state of Maryland currently is covered by a system of informal and formal mutual aid agreements. KACH has an established mutual aid agreement with the Anne Arundel County EMS system. Under this arrangement, adequate backup would be provided should KACH decide to staff only one ambulance.

Although a minimum of one ambulance is generally required for every 40,000 people, a single paramedic unit with adequate transport support and state-of-the-art priority dispatch may be adequate for up to 200,000 people (Kuehl 1994). Additionally, Colonel Matthew Rice, the U.S. Army's Office of the Surgeon General's (OTSG) Consultant for Emergency Medicine, indicated that most cities plan for one advanced life support (ALS) vehicle for every 100,000 people, depending on population density and expected illness and injury. According to Colonel Rice, one ambulance is sufficient because Fort Meade's workforce population is approximately 33,700 and the residential population is between 9,000 and 10,000. He stated, "Ft. Meade, by medical standards, does not need more than one ambulance for actual emergency services, and it could be staffed with one emergency medical technician and one paramedic" (telephone interview and letter to the author, February 1996).

A second option is contracting out either all or part of the ambulance service function. One of the oldest forms of EMS is that of the private profitmaking provider or private contractor. Originating in the days when ambulances operated out of funeral homes, these providers have evolved into highly efficient operations. Private contractors learned quickly to maximize efficiency, aggressively seeking service zones within the regional emergency systems that provided a steady flow of clients (Kuehl 1994). Contracting for ambulance services has become a common practice among local governments across the nation. Following the lead of the federal government, many municipalities have begun contracting with private companies to provide services that in the past were provided by government agencies.

Privatization of services seems to be a growing trend, and in many communities this includes EMS (Swan 1988). Jack Stout, head of The Fourth Party, a health care consulting firm, predicts that in 15 to 20 years, almost 50 percent of the U.S. EMS market will be served by five to seven large private companies that do business in a chain fashion throughout the country. He points out that the economies of scale at the local level are too small for sustained efficiency and good quality (Peterson 1988). It is believed that local governments will increasingly look to the private sector, with private companies competing head to head with public services.

HSC Regulation 40-5 acknowledges contracting as an alternative as it states "Facilities not offering in-house ambulance services--whether provided by hospital personnel or *contracted with a private EMS*--will comply with state standards for ambulance vehicles and other local requirements necessary in order to execute prehospital emergency care services" (HSC 1993). By contracting out the entire ambulance service function to a private contractor, KACH could use the seven authorizations originally projected for the ambulance section elsewhere within the organization. However, a contract must be in place and effective no later than September 1, 1996. This effective date is necessitated by the civilian RIF, which would force the loss of the ambulance section personnel by the end of the fiscal year. Consequently, the function would need to be assumed by the contractor prior to the end of the fiscal year.

After researching the process of contracting the entire ambulance function, I concluded this was not a viable option. When an organization desires to contract out a function that is currently being accomplished by ten or more personnel, a Commercial

Activities (CA) review is required. A CA review is an auditing process that calculates the current cost to the government of the evaluated function and compares it to the cost of contracting out the evaluated function. Although the process might seem simple, according to Major Michael Trivette, KACH's Chief of Resource Management Division, it is actually quite thorough and usually requires at least eight months to complete. Thus, contracting for the entire ambulance function, which is currently accomplished by a staff of 11 full-time permanent personnel and two intermediate on-call personnel, would require a full CA review. The CA review could not be finished with enough time allowed to establish a contract with an effective date of September 1st, or to meet the mandatory deadlines pertaining to a civilian RIF and the RIF notification process.

One other option emerged through the research process. HSC Regulation 40-5 states "If other federal agencies (e.g. *fire department*, security police) provide the ambulance support, the Director of Health Services will ensure the use of appropriate vehicles, the presence of currently certified emergency medical technician (EMT) personnel on emergency dispatches, and the maintenance of quality patient care services. Additional MEDDAC responsibilities include approving EMS protocols, delineating personnel qualifications, and monitoring training programs" (HSC 1993). This prompted me to investigate the possibility of transferring the ambulance service function to the post fire department. Chief Robert Miller, the Ft. Meade Fire Chief, reported that all but two of his 34 firefighters were certified EMTs and the post fire department currently responded to most emergency calls on-post as a first responder unit. Additionally, EMS providers housed in fire departments are one of the most common types of jurisdictional

models. Approximately one half of the EMS systems in the United States are fire-based (Kuehl 1994). Fire departments' vehicles and personnel are usually geographically well located, available 24-hours per day, and already oriented toward protecting life. Also, fire departments maintain highly structured methods of training and advancement, including regular continuing education.

Maryland EMS System - Organization and Oversight

As mandated by HSC Regulation 40-5, an MTF ambulance service must comply not only with DoD directives and standards, but also with any state and local requirements and standards. Therefore, I researched both federal EMS legislation and the Maryland EMS system in order to gain a better understanding of the relationship between KACH's EMS system and the local and state systems and determine how these relationships might influence a decision regarding any changes in the KACH system.

The modern era of prehospital care in the United States began in 1966. In that year the recognition of an urgent need, the crucial element necessary for aggressive development of prehospital systems, was heralded by the National Academy of Sciences-National Research Council (NAS-NRC) report. The report documented enormous failure of the U.S. health care system to provide even minimal care for the emergency patient (Committee on Trauma and Committee on Shock 1966). Consequently, the Highway Safety Act of 1966 established the cabinet-level Department of Transportation (DOT) and gave it legislative and financial authority to improve EMS. Specific emphasis was placed on developing a highway safety program, including standards and activities for

improving both ambulance service and provider training (National Highway Safety Act 1966). All states were required to have highway safety programs in accordance with the regulatory standards promulgated by the DOT. The standard on EMS required each state to develop regional EMS systems that could handle prehospital emergency medical needs.

Throughout the late 1960's and 1970's, various reports and legislative response to those reports attempted to establish and develop a national EMS system. However, the lack of national conformity or agreement by individual states precluded the development of universally accepted national standards in most areas of EMS. After the 1980 elections, the thrust of the federal government for most of the previous 50 years was changed beyond all recognition; the cadre of federal programs officials left to administrate the remaining programs had to cooperate with each of the 50 states. As federal guidance and funding diminished, a clear nationwide consensus was no longer a requirement for action; each state now had an intrinsic right to govern areas such as EMS (Kuehl 1994).

After clarifying the federal/state relationship with regards to EMS, I studied Maryland's EMS system. The enabling legislation for Maryland's system of EMS is found in the Education Article of The Annotated Code of Maryland, Sections 13-1D-01 through 13-1D-14 (1994 Cumulative Supplement). This act established an EMS Board. The creation of the Board was a result of the efforts of the Governor's Emergency Medical Services Commission established in the Fall of 1992. This commission reviewed Maryland's EMS system with the goals of improving that system and preparing it for

entry into the twenty-first century. The Commission's work led to the introduction of House Bill 1222, which established an 11-member EMS Board and positioned that Board and its staff at the Executive level in the State of Maryland (Section 1-1D-05). This EMS Board is the first of its kind in the nation to answer directly to a governor and reflects Maryland's commitment to its EMS system.

The EMS Board has numerous duties, including the development and adoption of an EMS plan to ensure effective coordination and evaluation of services in Maryland and the governance of the Maryland Institute for Emergency Medical Services Systems (MIEMSS). Other duties and responsibilities include: the authority to adopt regulations necessary to carry out its duties; ensure continued improvement of transportation for emergency, critically ill, and critically injured patients; review and approval of the EMS operating and capital budgets of MIEMSS; and appoint the Executive Director of MIEMSS.

The EMS Board is assisted by MIEMSS staff and the Statewide EMS Advisory Council (SEMSAC). The Council, representing statewide EMS interests, serves as the Board's principal advisory body and ensures that regional issues are represented effectively at the state level. The Board looks to this Council for support, direction, advice, and input. However, only the Board has rule-making authority.

Section 13-1D-03 establishes MIEMSS as an independent state agency located at the University of Maryland at Baltimore. MIEMSS has 83 full-time employees to coordinate a statewide system of emergency services and trauma services. Among many duties, the Executive Director of MIEMSS is charged with coordinating a statewide

system of EMS; coordinating the planning and operation of EMS with federal, state, and local governments; coordinating the development of centers for treating emergency injuries and illnesses, including specialty referral centers for those with specific needs; and administering state and federal funds for EMS in Maryland.

Created in 1973 by executive order of the Governor of the State of Maryland, MIEMSS has grown to encompass a coordinated program for training, testing, and certifying prehospital care providers; statewide communication and transportation networks; an Echelons of Care system including the R. Adams Cowley Shock Trauma Center, a university trauma center, seven areawide trauma centers, 20 specialty referral centers, and 49 emergency departments; and 16 rehabilitation facilities. The Echelons of Care protocol directs the transport of the critically ill and injured patients to the nearest medical facility that is best staffed and equipped to treat them.

The statewide communications network permits prehospital providers to consult hospital-based physicians for medical direction. The network can link the prehospital care provider with the Shock Trauma Center or any of the hospital emergency departments, areawide trauma centers, specialty referral centers, or central alarms. The Systems Communications Center (SYSCOM) provides 24-hour radio communication between prehospital care personnel and areawide trauma centers and specialty referral centers and coordinates all med-evac transports to these centers.

Through public education and community support, the dedicated phone number 911 has become the universal link to the multiple emergency resources available across the state. Police, fire, or emergency medical personnel and equipment can be accessed

with a single call. Maryland has had a complete 911 system since 1985, and now the entire system has been upgraded to "computer enhanced" 911 service. The enhanced service immediately provides the operators in the central alarm with the street address and phone number of the caller on a computer screen, essential in cases when the caller cannot provide that information. The 911 communication centers are part of the statewide EMS communications system which includes radio and microwave links, as well as a dedicated telephone network, called EMSTEL. The comprehensive statewide communications system was planned, developed, and implemented, and is now maintained by MIEMSS.

Each response of an emergency ambulance is recorded through the Maryland Ambulance Information System (MAIS). The MAIS report is completed by the prehospital provider with vital information about the type of incident and the pertinent patient information, essential for both patient in-hospital management and EMS system management. MIEMSS collects, processes, and manages these data.

There are five EMS regions in the state. Each region is directed by a regional administrator who manages the MIEMSS field operations programs at the local level. The regional administrators also serve as liaisons to the MIEMSS central office. Fort Meade is located in Region III, the largest urban area of the state. It includes Baltimore City and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties. This 2,475 square mile area houses more than 2.4 million people and is served by nearly 170 EMS transport vehicles. In addition to the EMS transport vehicles, fire suppression vehicles, police vehicles, and supervisor's vehicles are used as first responder vehicles. In Region

III, nearly 15,000 persons have some level of Maryland EMS certification. There are 23 hospitals in Region III (Maryland State EMS Board 1995). In summary, Maryland's EMS system is a cooperative, multi-disciplinary, broad, consensus-based program of integrated resources, agencies, hospitals, and dedicated individuals.

Staffing, Training, Certification, and Equipment

Before 1966 there had been little national, state, or local regulation of ambulance personnel; anyone with a driver's license could answer emergencies. The Highway Safety Act of 1966 provided funds to develop a training course curriculum for the new position of Emergency Medical Technician-Ambulance (EMT-A) (Kuehl 1994). The 70-hour curriculum originally published by the American Association of Orthopaedic Surgeons in 1969 has been updated several times, and is also published in other texts. The EMT-A curriculum became the mainstay of training in most states. The new profession was further defined and officially recognized as an occupational specialty by the Department of Labor in 1972. The EMT-A quickly became a nationally recognized standard.

The training for EMS personnel is regulated at the state level but is based on national recommendations from the DOT. In general terms, the following four levels of prehospital providers are common in North America: First Responder, emergency medical technician-ambulance (EMT-A), emergency medical technician-intermediate (EMT-I), and emergency medical technician-paramedic (EMT-P). Although, there are probably no two states that define and train these levels similarly, national standards

exist. The DOT established criteria for the four levels with ranges of required training hours. The National Registry of Emergency Medical Technicians (NREMT) is an independent, non-governmental agency established in 1970. The NREMT tests and certifies EMT-Basics (equivalent to the DOT's EMT-A), EMT-Is, and EMT-Ps. NREMT requires successful completion of an approved DOT training program. Some states require NREMT certification; others perform testing and certification through a state or local agency. The NREMT together with state regulatory agencies provide the framework for which the standards of care are maintained. DoD instruction 6000-10 directs that the individual services will ensure that all ambulance personnel will be trained at the EMT-A level (Jagoda and Pietrzak 1992). DoD also requires all of its EMTs to be NREMT certified (HSC Reg 40-5 1993). A recent decision allows the military to hire individuals with state but not national EMT certification. They must become certified by the National Registry within one year. Table 1 lists training hours for the four prehospital provider levels based on DOT standards.

Training Hours for Prehospital Providers				
Level	**Didactic**	**Clinical**	**Internship**	**Total**
First Responder	40	Optional	Optional	40
EMT-A	99 - 104	10	Optional	109 - 114
EMT-I	36 - 75	48	48	132 - 171
EMT-P	212 - 350	232 - 250	256 - 500	700 - 1100

Table 1: *Source*; (Kuehl 1994)

In modern EMS systems the term *First Responder* refers to nonmedical public safety personnel, usually firefighters or police. First Responders deliver basic first aid and cardiopulmonary resuscitation (CPR) until more highly trained EMTs or paramedics arrive. Advances in CPR education and the advent of automated external defibrillation (AED) have elevated this member of the prehospital team to, potentially, its most essential component (Ruskin 1988; Kuehl 1994).

EMT-As perform all the first responder skills and much more in many areas. In fact, it is becoming increasingly difficult to distinguish an advanced EMT from a paramedic. Most basic EMT-A courses require about 90 to 120 hours; however, many states and communities add training modules that can expand the curriculum to over 300 hours. The personnel trained in these programs have a number of confusing letters or numbers after their EMT designation including *T* for trauma, *A* for advanced, *I* for intubation, *D* for defibrillation, and now a new *B* for basic. To make it even more difficult, some state regulations include an intermediate level provider with a distinct set of quality improvement and medical oversight requirements.

The EMT-A curriculum is being revised. The DOT has funded a study considering a significant upgrade in the EMT-A scope of practice without a significant increase in teaching hours. Other issues under discussion include training time, quality improvement, medical oversight, legislation, and costs. The upgrade of the EMT-A curriculum to EMT-Basic (EMT-B) is controversial. The new EMT-B curriculum was field tested and first taught in early 1994. It will quickly replace the EMT-A curriculum because of the number of contact hours are essentially the same (Kuehl 1994).

The concept of EMT-I evolved as a provider level located somewhat between EMT-B and EMT-P. EMT-I used the EMT-B interventions as well as some of the advanced EMT-P techniques. A standard national examination for the intermediate level was approved in June 1980 by the National Registry. In most states, one becomes an EMT-I either by upgrading EMT-A or EMT-B skills through training and testing in appropriate add-on modules or by training and testing at an established intermediate level (Kuehl 1994). This intermediate level varies the most from state to state in scope of practice. Whatever the mechanisms, the usual justification for EMT-I is to provide some advanced skills in geographic areas that do not need or cannot afford paramedics.

Paramedics provide the most sophisticated prehospital care. Depending on law and local need, these providers administer an array of medications and initiate a large number of procedures. Paramedics have been the subject of extensive regulation and scrutiny during their short existence. The group has been required to test more frequently, complete more continuing education, and accept more direct supervision than any other health care professionals. Over the years, however, paramedics have established a niche in the health care systems and are considered true professionals. Paramedics are trained in the recognition and management of medical emergencies, and in trauma assessment, stabilization, and transport, advanced airway management, advanced life support protocols including defibrillation, and medication administration (Jagoda and Pietrzak 1992).

As stated earlier, each state establishes its own certification and training requirements for prehospital providers. The Maryland EMS system recognizes four

levels of prehospital medical certification and training, which can be divided into two categories: Basic Life Support (BLS) and ALS. According to MIEMSS, BLS is provided by First Responders and EMT-As. ALS is provided by Cardiac Rescue Technicians (CRT) and EMT-Ps. A CRT is a Maryland prehospital EMS field provider with the knowledge and skills of an EMT-B who can also perform certain advanced life support measures and administer a limited number of medications (approximately 240 hours of training beyond EMT-B). The Board of Physician Quality Assurance is a component of the Maryland Department of Health and Mental Hygiene that is charged with the oversight of quality assurance relative to the practice of medicine for licensed and unlicensed medical care providers. MIEMSS, along with the Board of Physician Quality Assurance (the State's ALS authority) and regional medical directors, sets the standards and protocols for Maryland's ALS providers. In addition, MIEMSS maintains, administers, and records the testing and certification of all BLS and ALS providers. The Maryland Fire and Rescue Institute is responsible for the majority of basic level prehospital training. Continuing medical education is reviewed, accredited, and, in many cases, coordinated by MIEMSS (Maryland EMS Board 1995).

Although Maryland's training and certification requirements don't exactly mirror the National Registry's standards, in its EMS Plan the EMS Board established as one of its objectives to adopt national "blueprint" for all levels of prehospital certification, including intermediate. Other related objectives are to design and develop modular training programs based on the national "blueprint" for use throughout the

state and provide a mechanism to allow current CRTs to voluntarily attain national level intermediate or paramedic certification (Maryland EMS Board 1995).

To operate as a paramedic-level ALS ambulance or unit, MIEMSS requires it be staffed with at least one EMT-P, in addition to the driver. MIEMSS requirements for drivers of commercial or private ambulances is that the individual possess a valid Maryland driver's license and be certified as a Maryland first responder (MIEMSS 1992). Minimal-level ALS units may operate with at least one CRT, in addition to the driver. BLS units must be staffed with at least one EMT-A or EMT-B, in addition to the driver. Usually, the drivers are EMT-As or EMT-Bs. Anne Arundel County, the county where Ft. Meade is located, increases the staffing level of ALS units by requiring them to be staffed by at least two ALS providers. This staffing level can be accomplished by either two EMT-Ps or one EMT-P and one CRT.

The AMEDD's guidance for ambulance staffing levels is more flexible than MIEMSS standards and is found in HSC Regulation 40-5. It states, "Two health care personnel will accompany each ambulance when dispatched on an emergency, the second may serve as driver. Any combination of appropriately qualified physician, CRNA, nurse midwife, EMS nurse, critical care nurse, EMT, or other health care personnel" (HSC Reg 40-5 1993).

Finally, the required equipment that ambulances must possess and maintain is regulated in the state of Maryland by MIEMSS through Title 14-Independent Agencies, Subtitle 22.07-MIEMSS Commercial Ambulance Regulations, Code of Maryland Regulations (COMAR). The Army addresses ambulance equipment requirements in

chapter 13-9 of Army Regulation (AR) 40-2, Army Medical Treatment Facilities General Administration. The equipment requirements are quite extensive, based on national standards of care, and, basically, very similar under both COMAR Title 14, Subtitle 22.07 and AR 40-2.

Response Times

One of the issues raised by the ambulance personnel during their interviews with the media was delayed response times due to reducing the ambulance section's authorizations. They felt that response times would be significantly longer because of the reductions and would compromise patients in life-threatening situations. The community reacted with concern regarding the possibility of delayed response times. This matter required research and investigation to determine if response times would be delayed as a result of reducing the ambulance staff; and if they were, would they still be adequate and acceptable. Despite more than two decades of growth of increasingly sophisticated EMS systems, there is still little knowledge regarding the impact of most prehospital care on patient outcome. There is currently no widely accepted model for the chronological time sequence of EMS response and care (Spaite et al. 1993). In the EMS industry, there is no such widespread agreement about what "response time" is or how it should be measured (Stout 1987). Most of the literature I reviewed pertaining to the evaluation of response times, determining medically optimal response times, and the affect of response times on medical outcomes were directed towards cardiac incidents. Other than literature referencing the "golden hour" in a trauma event, there were few studies or articles on the

effect of response time on medical outcomes of events other than cardiac (Feero et al. 1995). Consequently, the American Heart Association (AHA) became my primary source of information on response times.

In its Textbook of Advanced Cardiac Life Support (ACLS), the AHA has recently proposed the concept of a chain of survival for victims of cardiac arrest. The chain of survival includes four components: (1) early access to the EMS system, (2) early CPR either by bystanders or first responders, (3) early defibrillation by first responders, EMTs, or paramedics, and (4) early ALS(Cummins 1994). Each link in the chain must be strong to assure maximal survival rates for those who experience out-of-hospital cardiac arrest. Table 2 shows how dramatically survival rates can be influenced by the links in the chain of survival.

CARDIAC ARREST FROM VENTRICULAR FIBRILLATION		
Survival Rate as Related to Promptness of Initiation of CPR and ACLS		
Initiation of CPR in minutes	**Arrival of ACLS in minutes**	**Survival Rate in %**
<4	<8	43
<4	16	10
8 - 12	<16	6
8 - 12	>16	0
12	>12	0

Table 2: *Source*; Data from Seattle Heart Watch.

All the links are crucial, however, the earliest possible delivery of defibrillation is critical and almost by itself is sufficient for many victims of sudden cardiac death. Defibrillation has been cited in many studies as the single most effective intervention for

patients in nontraumatic cardiac arrest (ACLS Subcommittee and the ECC Committee 1991). The AHA reports in its textbook that rapid defibrillation is the single most important factor in determining survival (Cummins 1994). However, according to one study, in a fast-response urban EMS system served by paramedics, the impact of adding first-responder defibrillation appears to be small (Kellerman et al. 1993). Early defibrillation alone cannot overcome low community rates of bystander CPR. Careful attention to every link in the chain of survival is needed to achieve optimal rates of survival after cardiac arrest.

As seen by the data and the number of studies conducted on the subject, a quick response time can have a significant influence on cardiac arrest victims. However, to put things into perspective, cardiac arrest victims account for less than two percent of all EMS responses (Spaite et al. 1993). Furthermore, non-traumatic life-threatening cases that could be affected by response times such as cardiac arrest, myocardial infarction and near-drowning make up less than 20 percent of the total EMS population (Bourn 1994).

Recognizing the importance of quick response times, I pursued further information regarding the standard of care related to response times. Is there a national or state mandated maximum allowable or acceptable response time? Has there been a nationally or state recognized standard of care regarding response times? How are response times measured and reported? These questions must be answered in order to establish a means for evaluating the various COAs.

According to Colonel Rice, there is no nationally mandated standard for ambulance response times. He said, "Response time standards are determined in a

community by medical goals and economic goals." However, he indicated there are "medically optimal" response times recognized in the EMS industry. The "rule of thumb" I found in most of the literature was BLS delivered with a response time of less than five minutes, 90 percent of the time, and ALS in less than nine minutes, 90 percent of the time (Ornato 1995).

Prehospital response time is derived by combining a series of time intervals that occur from the time an event occurs (trauma, cardiac arrest, et cetera) until the patient's care is transferred to the hospital (Spaite 1993). By using the AHA ACLS Textbook as a guide, two intervals are combined for the purpose of determining and measuring response times for ambulance service. Those two intervals are:

> 911-call-to-dispatch interval - The interval from the time the call for help is first received by the 911 center until the time the emergency vehicle leaves for the scene.
>
> Vehicle-dispatch-to-scene interval - The interval from when the emergency vehicle departs for the scene until EMS responders indicate the vehicle has stopped at the scene. This does not include the time interval until emergency personnel arrive at the patient's side or the interval until treatment/intervention occurs.

This definition of response time intervals is consistent with the intervals recorded and measured by MIEMSS. In 1994, the statewide average time for the 911-call-to-dispatch interval was one minute and the vehicle-dispatch-to-scene interval was 5.4 minutes, resulting in an overall ambulance response time average of 6.4 minutes (telephone interview with Jim Brown, MIEMSS Region III Director of Education and Support Services conducted by author, February 1996). Additionally, John Donahue, the

Regional Administrator for MIEMSS Region III, stated there is no state or locally mandated response time for ambulances. He said MIEMSS goal is to deliver care within the medically optimal time intervals based on the AHA recommendations (telephone interview with author, February 1996).

Description of Kimbrough's Ambulance Section

In order to select the best COA, I must possess a comprehensive understanding of KACH's current ambulance section operations or the "status quo" in order to establish a baseline for comparison. As mentioned earlier, KACH's ambulance section operates two ALS units, staffed by two-man crews, 24-hours a day, seven days a week. Also, the ambulance section's supervisor works a 0730 to 1600 shift, Mondays through Fridays, for a typical 40-hour work week. Thus, there are five personnel working during the duty day and four personnel working on evenings, weekends and holidays. On the current TDA, the ambulance section has 15 full-time permanent authorizations. The ambulance section staff consists of 11 full-time equivalents (FTEs) (ten EMT-Ps and one CRT) and two intermediate on-call or IOCs (EMT-Ps). Because of the staffing shortage the crew members often work overtime, driving up the payroll costs. The ambulance section controls two fully-equipped ALS vehicles and two patient transport vehicles (PTVs). The vehicles are procured by the garrison's troop motor pool (TMP) through government leases. The TMP assumes responsibility for the cost of the vehicles, to include leases, maintenance and fuel. However, the cost of the TMP service is factored into KACH's base operations (BASEOPS) bill by the garrison. BASEOPS is the portion of a tenant

unit's budget that pays for things such as utilities and other services provided by the garrison.

During FY95, the ambulance section performed 1,600 runs, producing a monthly average of 133.33 runs and a daily average of 4.38. Under the mutual aid agreement, Anne Arundel County ambulances performed a total of 76 runs on Ft. Meade in calendar year 1995. Of the 76 runs, however, 37 were to the county schools located on post, which are in the primary jurisdiction of Anne Arundel EMS. Therefore, only 37 mutual aid runs were performed by the county. Based on the workload information alone, the current operating level appears to be excessive. A description of the FY95 workload data will be discussed in more detail during the *Method and Procedures* section of this paper.

Unfortunately, the data collection procedures employed by the ambulance section are primitive, to say the least. Therefore, the data collected and analyzed for the purpose of this decision-making process was done so by manually coding and inputting into a Lotus spreadsheet, line by line, the handwritten information from the log book. Information about the intensity of care/treatment rendered (ALS versus BLS) during each run was not available for FY95. However, a manual study of the data collected from ambulance runs during the first quarter of FY96 revealed that approximately 65 percent of the runs required BLS procedures, while 35 percent required ALS procedures.

The cost of the ambulance section for FY95 was $669,347. This figure includes the ambulance section's portion of KACH's operating budget and the cost of the vehicles. A breakdown of the costs is shown in Table 3. An average cost per run of $418 is calculated by dividing the FY95 costs by the 1,600 runs performed in FY95.

Finally, the ambulance section's average vehicle-dispatch-to-scene interval for FY95 was 3.89 minutes, significantly lower than the state average of 5.4 minutes. This response time was calculated by compiling the response times reported on the MAIS run sheets and dividing by the total number of runs for which response times were reported.

KACH Ambulance Section Costs	
FY95 Operating Budget	
Category	**Amount**
Civilian Pay	$626,300
Conference Fees	$4,500
Supplies and Equipment	$5,720
FY95 TMP Costs	
Vehicles (leases, maintenance and fuel)	$32,827
Total Cost of Ambulance Section	$669,347

Table 3

However, this response time average does not include the 911-call-to-dispatch interval. When the one minute statewide average for the 911-call-to-dispatch interval is added to the KACH ambulance section average vehicle-dispatch-to-scene interval, the average response time is raised to 4.89 minutes.

Description of Similar Organizations

In an effort to develop a variety of COAs, I researched organizations similar to KACH (i.e. MTFs that had been reduced from hospitals to outpatient clinics, or MTFs that had historically been outpatient clinics and were the sole provider of medical and

ambulance services for their post population). By researching these MTFs, I hoped to identify which methods of providing ambulance service were successful and might be viable options to be considered or pursued by KACH. I also wanted to identify inefficient or unsatisfactory methods that should be avoided. And finally, I hoped to gain insightful and experienced opinions, advice, and information from personnel involved with the delivery of ambulance service and prehospital care for their MTFs.

Kirk Army Health Clinic - Aberdeen Proving Ground, MD

Kirk Army Health Clinic is a clinic under the command and control of the Fort Meade MEDDAC. In addition to Kirk, there is a smaller, satellite clinic (Edgewood Clinic) also located on Edgewood Arsenal. Kirk operates two ambulances staffed with in-house personnel from 0700 hours until 2300 hours Monday through Friday. One is located at the Kirk clinic and the other is located at the Edgewood clinic. On the weekends and from 2300 hours until 0700 hours, only one ambulance is operated from the Kirk clinic. The TDA authorizes seven positions for the ambulance function, however, Kirk has staffed 17 personnel (13 EMT-Ps, 3 EMT-Bs. and one dispatcher) to accomplish this function. In FY95, the ambulance section performed 1,269 ambulance runs (106 per month) with an average response time of approximately seven minutes. The total cost of the ambulance section wasn't available, however, the FY95 payroll alone was $573,000. By dividing the payroll figure by the number of runs performed, an average cost of $452 per run is calculated. Of course, the average cost per run is actually

higher when the other costs (i.e. vehicle, fuel, training, equipment, supplies) are factored into the equation.

Due to the high cost for the ambulance service, Kirk has recently entered into a memorandum of agreement with the U.S. Army Garrison, in which the post fire department assumes operational control for the emergency medical services at APG while Kirk continues to provide technical supervision and funding.

Patterson Army Health Clinic - Fort Monmouth, NJ

Patterson Army Health Clinic was reduced from a hospital to a clinic in June 1995. Patterson continued to provide ambulance services with in-house staff during the day and evenings during their transitional phase (June through September 1995) and contracted out the night shift ambulance coverage. Beginning with FY96 (October 1995), Patterson contracted with a private commercial patient transport service for the entire ambulance function. This company provides both the patient transport service and the post "911" emergency ambulance service. The company staffs their ambulances with personnel certified at the EMT-B level. The contract requires these individuals maintain NREMT-B certification. According to contract specifications, the ambulance company must respond to calls in no longer than 15 minutes for post "911" calls and within one hour for calls from the clinic for patient transport. The company's station is located approximately five miles from the clinic, however, they often preposition an ambulance at the clinic. The average response time for "911" calls is reported as somewhere

between 10 and 12 minutes when the ambulance is not prepositioned at the clinic. ALS service is provided through Monarch ALS Service, a local, not-for-profit (NFP), ALS consortium owned by local hospitals. Monarch monitors "911" dispatches and arrives on the scene to provide ALS whenever it is necessary. Monarch does not provide patient transport. The paramedics from Monarch ride along with the BLS ambulances transporting patients in need of ALS.

In FY94, Patterson's in-house ambulance section performed 646 runs (54 per month). For the period of October 1995 through mid-February 1996, the contracted company performed 200 runs (45 per month). In FY94, Patterson's in-house ambulance section's cost was $503,400, which breaks down to an average of $779 per run. It's easy to understand why Patterson went with a different option to provide this service. The ambulance run fees were negotiated and set in the contract as follows: $164 for a local run (within a 15 mile radius); $264 for long distance runs, however that fee has recently been renegotiated to almost twice that amount; and, $50 for each fire standby mission. For the period of October 1995 through mid-February 1996, Patterson has paid the contracted company $27,300, which breaks down to an average of $137 per run.

Although costs have been reduced significantly through the contract, Patterson relates some dissatisfaction with the ambulance service provider. The long response times and the lack of ALS-trained personnel are just a few of the reported complaints. Patterson indicates that once the contract expires, they will probably seek another company to provide the ambulance service.

Dunham Army Health Clinic - Carlisle Barracks, PA

Dunham Army Health Clinic is also under the command and control of the Fort Meade MEDDAC. Dunham operates one ambulance with in-house military staff predominantly during clinic hours during the duty week. However, due to personnel shortages and equipment problems, the ambulance coverage is sporadic, to say the least. They currently staff the section with three 91Bs/EMT-Bs. A private NFP commercial ambulance service with municipal support provides supplemental BLS ambulance coverage for the post. Another private NFP ambulance service receiving no municipal support provides supplemental ALS service for the post. The ALS service is provided in a similar fashion to the Monarch service at Fort Monmouth, where the ALS providers ride along on the BLS transport vehicle. The county dispatcher logged 187 "911" runs performed on Carlisle Barracks by the private ambulance services and the Dunham clinic ambulance in calendar year 1995 with an average response time of approximately five minutes. Dunham was unable to report the ambulance section cost for FY95. They did report that they had paid out $9,613 in FY95 for runs performed by the private services. The average cost was $250 for a BLS run and $245 for an ALS run. The ALS fee was negotiated through an agreement with the ALS service. Dunham further explained it only pays for BLS runs generated by the clinic. The charges for other BLS runs generated on-post through "911" calls are billed to the individual's insurance or CHAMPUS.

Guthrie Ambulatory Health Clinic - Fort Drum, NY

Guthrie Ambulatory Health Clinic operates one ambulance 24-hours a day, seven days a week. This ambulance provides service for the entire post, which is home to the 10th Mountain Division and its support units. The TDA authorizes seven positions to carry out the ambulance function. Guthrie staffs the ambulance section with ten personnel (two EMT-Ps, four EMT-Is, and four 91Bs/EMT-Bs). In FY95, the ambulance section performed 1,100 runs (92 per month) with an average response time between five and eight minutes. Guthrie has a mutual aid agreement with Jefferson County. I was unable to obtain cost information for Guthrie's ambulance section.

By gathering information pertaining to other clinics' ambulance sections and their methods of delivering prehospital care and comparing it to KACH's data, my impression that KACH's ambulance service was both excessive and expensive was further validated. I was also able to utilize some of the other clinics' methods of delivering ambulance service as COAs for KACH. This information proved to be most helpful during the process of selecting and developing COAs.

Purpose of the Study

The purpose of this study is to reach an informed and educated decision regarding the provision of ambulance service by conducting an impartial and well-researched decision-making process. The ultimate objective is to identify the best COA and implement a sound decision which meets both the Fort George G. Meade's and KACC's ambulance service needs while supporting the implementation of KACC's transition plan

necessitated by the BRAC legislation. Retrospective analysis may be conducted after the implementation of the decision to determine if the chosen method for delivery of ambulance service is, in fact, a quality service provided in an effective and resource-efficient manner. The results of the retrospective analysis may be used to assist in future decision-making processes which, most likely, will be conducted by other medical facilities as manpower and budget reductions continue to be a reality and a management challenge. Therefore, an additional objective of this study is to provide a decision-making model which may be used by other medical facilities facing similar circumstances and decisions.

METHOD AND PROCEDURES

The Decision-Making Process

Decisions should be thought of as means rather than ends. They are the organizational mechanisms through which an attempt is made to achieve a desired state. They are, in effect, an organizational response to a problem. Every decision is the outcome of a dynamic process that is influenced by a multitude of forces (Ivancevich and Matteson 1993). The decision-making process typically involves the following: (1) establishing specific goals and objectives; (2) problem identification and definition; (3) development of alternative solutions; (4) evaluation of alternative solutions; (5) solution selection; (6) implementation; and (7) follow-up. However, this process is not a fixed procedure. It is a sequential process rather than a series of steps. Problems that occur infrequently, with a great deal of uncertainty surrounding the outcomes, require

utilizing the entire process. Thus, in an effort to reach the best decision regarding the provision of ambulance service, I went through the entire decision-making process.

First of all, the specific goal is to implement a decision that produces the best delivery of ambulance service which is adequate to meet the needs of the service area in a resource-efficient manner. The problem has already been identified and defined in the "Problem Statement" section of this paper. Following the decision-making sequence, I focused on researching and developing as many alternative solutions as possible and reasonable in order to provide ample COAs for consideration.

Ambulance Workload Data Analysis

The COAs were developed and evaluated based on the facts and information obtained during the literature review, to include lessons learned from similar organizations and the EMS systems they operate. Furthermore, I analyzed the KACH ambulance section's FY95 workload data, broken down by shift (Table 4), and used the analysis to project future workload (Table 5). The definitions of each run type may be found at Appendix B. The workload data was obtained from the log book maintained by the ambulance section supervisor.

The ambulance personnel must fill out a MAIS sheet and a MEDDAC (Ft Meade) Form 415 (Rev), Request for Medical ransportation for each run they perform. Information such as type of run (emergency or routine), location of patient, patient beneficiary category, patient complaint/illness/injury, destination of patient, and treatment rendered is recorded on the MAIS sheet and MEDDAC Form 415. Entries are

FY95 Average Monthly Workload Data				
Type of Run	**Day Shift**	**Evening Shift**	**Night Shift**	**Monthly Totals**
ER Transfers	7.08	12.75	4.25	24.08
AMIC Transfers	0.00	0.00	0.00	0.00
Ward Transfers	7.08	2.67	0.33	10.08
Routine Transports	3.33	1.67	1.67	6.67
911 with Pt Tx	27.21	16.94	7.19	51.34
Fire Standby	15.83	7.00	4.33	27.16
Other/Non-Pt	7.17	4.50	2.33	14.00
MonthlyTotals	67.70	45.53	20.10	133.33

Table 4: *Source*; KACH FY95 Ambulance Log Book

Projected Average Monthly Workload				
Type of Run	**Day Shift**	**Evening Shift**	**Night Shift**	**Monthly Totals**
ER Transfers	0.00	0.00	0.00	0.00
AMIC Transfers	7.14	12.86	0.00	20.00
Ward Transfers	0.00	0.00	0.00	0.00
Routine Transports	0.00	0.00	0.00	0.00
911 with Pt Tx	27.21	16.94	7.19	51.34
Fire Standby	15.83	7.00	4.33	27.16
Other/Non-Pt	7.17	4.50	2.33	14.00
Monthly Totals	57.35	41.30	13.85	112.50

Table 5: *Source*; KACH FY95 Ambulance Log Book

made in the log book using information reported on the MAIS run sheets and the MEDDAC Form 415s. The MAIS run sheet is shown at Appendix C and the MEDDAC Form 415 is at Appendix D.

The projected workload data allowed me to anticipate the demand for ambulance service by shift, and the staffing level necessary to meet the expected demand. The literature review and the projected workload data served as the basis for the formulation of the most appropriate and feasible COAs. Also, due to the lack of published information regarding similar studies, I employed a modified delphi technique. I was able to validate certain COAs and evaluation criteria, as well as discard others by soliciting the advice and opinions of subject matter experts (SMEs). Information the SMEs provided was instrumental in the development of the COAs and the selection of criteria for evaluation purposes.

Description of Courses of Action

Six COAs were developed. The assumptions made regarding all COAs considered were that each COA would: (1) be staffed by individuals meeting state and DoD regulatory requirements regarding certification and licensure; (2) maintain vehicles and equipment meeting state and DoD regulatory requirements; (3) provide ALS service; and (4) be in place and operational by September 1, 1996. Also, the assumption that back-up coverage will continue under the mutual aid agreement with Anne Arundel County was factored into the COAs. This assumption was made after receiving confirmation from the county fire chief, Chief Simonds, that the county would have no problem

providing up to 200 mutual aid runs per year for Fort Meade. An indepth description of each COA is discussed below.

COA 1: In-House Status Quo

This COA assumes no change from KACC's current method of providing ambulance service. The staffing and equipment levels would not change and therefore, the total cost of the ambulance section would remain the same. The 0198 Table of Distribution and Allowances (TDA) authorizations required for this COA are 15 and the annual cost is $669,347. However, because of the projected decrease in the required number of ambulance runs from 1,600 to 1,350 per year, the average cost per run will actually increase from $418 to $496. The average response time would be expected to remain at 3.886 minutes.

COA 2: In-House with Adjusted Staffing Levels

This COA assumes the ambulance service will continue to be provided by the KACC in-house staff, however, with adjustments made to the staffing levels. There are two variations of COA 2.

COA 2a: 2 Ambulances/Clinic Hours; 1 Ambulance/Non-clinic Hours

COA 2a assumes the ambulance service will continue to be provided with the current staffing and equipment levels during KACC's hours of operations (0800 - 2200). During non-clinic hours (2200 - 0800), an adjustment is made to the staffing level and the ambulance section would operate only one ambulance with one ambulance crew. This

COA is suggested due to the significantly low demand for ambulance service during non-clinic hours which was revealed during the workload data analysis. The annual cost of this COA is $504,004, which computes to an average cost of $373 per run (based on the projection of 1,350 runs per year). The 0198 TDA authorizations required for this COA drop from 15 to 11. The reduction in annual cost and authorizations is based on a reduction from 712 to 524 manhours per week required to staff this model. This equates to a 26.4 percent reduction which was then applied to the total annual cost and the 0198 TDA authorizations. The average response time is expected to remain at 3.886.

COA 2b: 1 Ambulance/24 Hours

COA 2b assumes the ambulance section will only operate one ambulance with one crew on a 24 hour basis. This adjusted staffing level is suggested due to the workload data analysis and various SMEs indicating one ambulance is adequate for coverage of the Fort Meade population. The reduction in annual cost and authorizations is based on a reduction from 712 to 376 manhours per week required to staff this model. This equates to a 47.2 percent reduction which was applied to the 0198 TDA authorizations and the total annual cost. The 0198 TDA authorizations required for this COA drop from 15 to 8 and the ambulance section's annual cost would decrease from $669,347 to $373,733. However, due to only having one ambulance for coverage, the assumption that some patient transports would need to be contracted at an average of 30 per month for a cost of $350 per transport tacks on an additional $126,000 to the annual cost. This results in a total annual cost of $499,733, which computes to an average cost

of $370 per run (based on the projection of 1,350 runs per year). A projected increase from 39 to 59 mutual aid runs will be required of the county. The average response time is expected to increase slightly because Anne Arundel County's average response time is 6.5 minutes. However, the increase from 3.886 to 3.999 minutes for the average response time is considered insignificant.

COA 3: In-House/Clinic Hours; Contract/Non-clinic Hours

This COA assumes KACC's ambulance section will provide service during clinic hours and ambulance service will be provided by a contracted provider during non-clinic hours. There are two variations of COA 3.

COA 3a: In-House 2 Ambulances/Clinic Hours; Contract/Non-clinic Hours

COA 3a assumes ambulance service will be provided by KACC's ambulance section with the current staffing and equipment levels during clinic hours and a contracted provider will be responsible for coverage during non-clinic hours. This COA is suggested in order to alleviate KACC from staffing the ambulance section during the low-demand non-clinic hours. By contracting for coverage during non-clinic hours, KACC will only pay for each run performed. The reduction in annual cost and authorizations is based on a reduction from 712 to 368 manhours per week required to staff this model. This equates to a 48.3 percent reduction which was applied to the 0198 TDA authorizations and the total annual cost. The 0198 TDA authorizations required for this COA drop from 15 to 8 and the ambulance section's annual cost would decrease from $669,347 to $366,844. The contracted provider would perform an average of 30 runs per

month (based on projected workload data) at $385 per run for an annual cost of $138,600. This results in a total annual cost of $505,444, which computes to an average cost of $374 per run (based on the projection of 1,350 runs per year). The average response time is expected to remain at 3.886.

COA 3b: In-House 1 Ambulance/Clinic Hours; Contract/Non-clinic Hours

COA 3b assumes ambulance service will be provided by KACC's ambulance section's staffing one ambulance with one crew during clinic hours and a contracted provider will be responsible for coverage during non-clinic hours. The adjusted staffing and equipment levels proposed for this COA are suggested for the same reasons related in COA 2b and COA 3a. The reduction in annual costs and authorizations is based on a reduction from 712 to 184 manhours per week required to staff this model. This equates to a 71.3 percent reduction which was applied to the 0198 TDA authorizations and the total annual cost. The 0198 TDA authorizations drop from 15 to 4 and the ambulance section's annual cost would decrease from $669,347 to $222,795. However, a few more assumptions were applied to this model. First of all, again due to only one ambulance providing coverage, two patient transporters would be hired for a combined salary of $65,000 per year. Also, an additional 10 patient transports per month would be contracted at a rate of $350 each, for an annual total of $42,000. The non-clinic hours coverage provided by the contracted provider would be the same as COA 3a--30 per month (based on projected workload data) at a rate of $385 each, for an annual total of $138,600. After adding up the additional authorizations and costs, the total 0198 TDA

authorizations required for this model still drop from 15 to 6, and the total annual cost decreases from $669,347 to $468,395, resulting in an average cost of $347 per run (based on the projection of 1,350 runs per year). A projected increase from 39 to 49 mutual aid runs will be required of the county. The average response time is expected to increase slightly because Anne Arundel County's average response time is 6.5 minutes. However, the increase from 3.886 to 3.980 minutes for the average response time is considered insignificant.

COA 4: Transfer Ambulance Function to Post Fire Department

This COA assumes the operational control of the ambulance service would be transferred to the post fire department. However, the process to transfer a function and the personnel authorizations necessary to accomplish that function from one Major Command (MACOM) to another is rather lengthy and can take up to three years. Therefore, the ambulance personnel authorizations would remain on Kimbrough's TDA and the cost of the service would continue to be a part of Kimbrough's operating budget during the transfer process. This COA is suggested because of the economies of scale that may be realized through this model. As mentioned earlier in this paper, most of the firefighters are EMT certified and function as first responders to "911" calls on Fort Meade. By assuming operational control of the ambulance service, the fire department can prioritize emergency calls and dispatch the appropriate level of response (BLS versus ALS), instead of an ALS ambulance and a fire truck with BLS providers responding to every call. Also, efficiencies in staffing may be accomplished by cross-training the

paramedics and firefighters. Under this COA, the 0198 TDA authorizations required for this model would drop from 15 to 7, and the total annual cost would be $387,045, computing to an average cost of $287 per run (based on the projection of 1,350 runs per year). The annual cost is based on the top seven FY95 salaries of the current ambulance section staff in addition to the other FY95 costs. A projected increase from 39 to 59 mutual aid runs will be required of the county. The average response time is expected to increase slightly because Anne Arundel County's average response time is 6.5 minutes. However, the increase from 3.886 to 3.999 minutes for the average response time is considered insignificant.

The Decision-Making Matrix

The proposed COAs were compared to each other in order to determine the best or most appropriate and cost-efficient COA. The method used for evaluating the COAs was to apply each COA to a decision-making matrix and compare the resulting scores. Each COA attained a weighted score based on assigned weights for each evaluated criteria. The criteria selected for evaluation were response time, cost, and 0198 TDA. The operational definitions for the criteria are listed below:

> Response Time - The interval of time between the time a "911" call is received and the time an ambulance arrives on the scene. The minimum acceptable standard is a response time of no longer than eight minutes. This variable will be measured and reported in average minutes for response time of the evaluated COA. The shorter the response time variable, the higher the score given to the COA.
>
> Cost - Total per run cost to perform the ambulance service function. In-house cost includes salaries, conference fees, equipment and supplies, and vehicle costs.

Contract cost is the proposed amount by the contractor, either on a fee for service per run basis or a monthly "hours of coverage" basis. This variable will be measured and reported in actual dollars or total cost per run of the evaluated COA. The average per run cost is determined by dividing the total annual cost by the total annual number of ambulance runs performed. The lower the cost variable, the higher the score given to the COA.

0198 TDA - The total number of authorizations required to accomplish the ambulance service function. The Draft 0198 TDA projected seven authorizations to accomplish the function in accordance with the MSAP. This variable will be measured and reported in actual number of authorizations required to perform the ambulance service function by the evaluated COA. The lower the number of authorizations required variable, the higher the score given to the COA.

The criteria were selected after conducting research regarding ambulance services and determining which measurements were appropriate for evaluation of ambulance services. Furthermore, the following weights were assigned to the criteria:

Response Time	1.5
Cost	1.0
0198 TDA	1.0

The response time criterion score was given the largest weight because of its life safety implications, therefore making it a quality issue. The cost and 0198 TDA criteria scores were given equal weights as they were determined to be of equal importance. After the value of each variable was determined for each COA, a rank was given to the COA based on where it fell in comparison to the other COAs. The rankings were done in ascending order so that the COA with the worst value for a criterion received the lowest numerical rank of one and therefore, the COA with the best value for a criterion received the highest numerical rank. This rank was then multiplied by the criterion's associated

weight to arrive at the weighted value or rank for each criterion of each COA. The COA which achieved the highest score for its evaluated criteria was the recommended decision. Table 6 displays the decision-making matrix used to rank and score the COAs.

Decision-Making Matrix											
	Response Time	Rank	Weighted Value (1.5)	Cost Per Run	Rank	Weighted Value (1)	0198 TDA	Rank	Weighted Value (1)	Total Wt. Score	Overall Rank
COA 1	3.886	3	4.5	$496	1	1	15	1	1	6.5	6
COA 2a	3.886	3	4.5	$373	3	3	11	2	2	7.5	5
COA 2b	3.999	1	1.5	$370	4	4	8	3	3	8.5	4
COA 3a	3.886	3	4.5	$374	2	2	8	3	3	9.5	3
COA 3b	3.980	2	3.0	$347	5	5	6	4	4	12	2
COA 4	3.999	1	1.5	$287	6	6	7	5	5	12.5	1

Table 6

THE RESULTS

After applying each COA to the decision-making matrix, COA 4: Transfer Ambulance Function to Post Fire Department emerged as the COA with the highest overall score of 12.5, thus making it the recommended decision. COA 3b came in a close second with an overall score of 12, followed by COA 3a with a score of 9.5, COA 2b with a score of 8.5, COA 2a with a score of 7.5, and finally, COA 1 with a score of 6.5.

DISCUSSION

My hunch at the beginning of this project, that the findings would support a change in the current method of providing ambulance service, was proven through the objective decision-making process. Virtually every other COA emerged as a better

decision than the status quo. The status quo or current staffing level of Kimbrough's ambulance section goes considerably beyond meeting the need or demand for ambulance services. My suspicion that Kimbrough's current method of providing ambulance service was excessive and a source of waste seems to have been valid. That's not to say that the current manner of operations isn't good. It clearly is the maximum or optimal level of staffing which can anticipate virtually any prehospital care contingency on Fort Meade. If Kimbrough weren't faced with the challenging task of downsizing and reducing its operating budget, no change to this service would be necessary or recommended. However, excesses are no longer a luxury we can afford and changes must occur. Therefore, transferring the ambulance function to the fire department not only materialized as the clear "winner" in the decision-making process, but it also just seems like the logical and right thing to do. As stated earlier in this paper, over 50 percent of all civilian ambulance services are operating out of fire departments. By combining these two key elements of the emergency response system, opportunities for enhanced collaboration, coordination and communication are realized, as well as the aforementioned efficiencies which are achieved through economies of scale.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings obtained from the decision-making matrix, during a briefing to Kimbrough's Executive Committee I recommended that COA 4, the decision to transfer the ambulance function to the post fire department be implemented. This COA was selected and approved by the Executive Committee.

It should be noted, however, that transferring a function from one MACOM to another is not only a lengthy process, but also a complicated one. Before the transfer could be accomplished, the decision had to be approved by both the Military District of Washington MACOM through the U.S. Army Garrison, Fort Meade Commander, Colonel Dave Toops and the Fort Meade Installation Commander, Major General James Harding, as well as the U. S. Army Medical Command MACOM through the North Atlantic Health Service Support Area Commander, Major General Ronald Blanck. Furthermore, because the transfer affects the working conditions of the ambulance section employees (i.e. different working environment, different supervisor, a change in job descriptions, etc.) representatives from the employee's union and the Civilian Personnel Office had to be included in the transfer process and during the development of the memorandum of agreement (MOA).

I am pleased to report that the MOA has been developed and signed by all stakeholders involved with this agreement (see Appendix E). The post fire department will assume operational control of the ambulance service function by September 1, 1996. The MOA states that the service will periodically be subject to review and evaluation to determine if it is operating successfully and efficiently without jeopardizing life safety or compromising the quality of patient care rendered. Should any problem arise under this new method of delivering prehospital care, Kimbrough reserves the right to reclaim operational control of the ambulance function. The number of ambulance runs demanded by the post population, the number of runs performed by the post fire department, the number of mutual aid runs performed by the county, and the civilian pay expenditures for

the seven ambulance personnel should be monitored on a monthly and annual basis to be used as management indicators for evaluation of the efficiency and successfulness of this decision.

If this decision results in anything less than success, I recommend contracting out the entire function. As mentioned earlier in this paper, I determined that contracting the entire function was not a viable option due to the inability to accomplish a full CA review in the time required for the decision to be implemented. However, a CA review should be initiated immediately in the event that the recommended decision, once implemented, should fail for some unforeseen reason. I researched and developed contracting the entire function as an additional COA and applied it to the decision-making matrix. This COA resulted in an even higher score than COA 4, making it the best solution. If this COA could have been implemented by the required timeline, I would have recommended contracting the entire ambulance function. This COA achieved the highest score because the contractor could operate from on-post or from facilities very close to post, resulting in a response time equal to the current one. Also, this COA would not require any TDA authorizations. Finally, based on the quote from just one proposal, the average cost per run would only be $311. It can be assumed that should a request for proposals for this contract go out, an even more competitive bid would likely be presented. Therefore, due to its quick response time, low cost, and requirement of zero TDA authorizations, this COA is obviously one that should be considered and pursued in the future.

Post Emergency Medical Services Endangered

The Maryland Gazette reports that the paramedics on post were informed that, they will respond to calls only from 8 a.m. to 4 p.m. on weekdays. Currently, this service is available 24 hours a day, 7 days a week.

There have been 157 emergencies already missed due to the lack of available resources in 1995. There are still plans to cut this service even further.

The "done deal" would match paramedic services to the hours of the projected sick call. One unit that was not transferring patients would handle any emergencies, between the hours of 8 a.m. to 4 p.m., excluding weekends and holidays.

They tout that they need these services for transfers only and that they do not require coverage for a healthy, active-duty population. Anne Arundel County would attempt to respond to emergencies as it has in the past.

However, The Sun in Anne Arundel reported that Anne Arundel County is already stretched to its limit. A private consultant is quoted in this article printed December 17th, "The County relies too heavily on outdated strategies from the 1970s." They are currently searching for private companies to reduce delays.

It should be noted that there are no private companies stationed in Anne Arundel County at this time. Of the more than 40 companies now operating in Maryland, there are none that have ever been used in emergency situations.

The most recent article by Christine Rodrigo reports that the current paramedic services would be reduced by two-thirds. **There have already been 157 calls missed in 1995.**

Fellow EFMP family members, please help us stop this mistake. We need services to **expand** due to the calls missed every year and the problems in the surrounding county. There are more defense schools and higher populations planned for the future. EFMP services would decrease when they are needed to increase.

We can let our needs be known to the KACH command, our commands and our representatives at the state and federal level. Let your representatives from your home state also know of this situation. We can avert this tragedy together.

PS. ON MONDAY JAN 1, 1996 (New Years Day) 2 HIGHLY TRAINED FT. MEADE PARAMEDICS RESPONDED TO A FT MEADE RESIDENCE FOR A 3 MONTH OLD IN A LIFE THREATENING FULL ARREST. THEY DID THEIR JOB AND THE BABY ARRIVED AT KIMBROUGH ALIVE.
AS STATED, UNDER THE CURRENT PLAN THERE WILL NOT BE A FT MEADE AMBULANCE AVAILABLE FOR YOUR EMERGENCY DURING EVENING, NIGHT, WEEKEND + HOLIDAY HOURS.
ARE WE WILLING TO TOLERATE THIS SITUATION FOR OUR FAMILIES WHO ONE DAY MIGHT NEED AN AMBULANCE AFTER JUNE 1, 1996?
PLEASE SIGN THE PETITION THAT WILL FOLLOW THIS MESSAGE.

DEFINITIONS OF AMBULANCE RUN CATEGORIES

ER Transfers - The ambulance runs generated from KACH's ER. This run may be to transport a patient from KACH's ER to another medical facility's ER or for admission to another medical facility. After the ER ceases to operate (June 1996), there will no longer be ER transfers.

AMIC Transfers - The ambulance runs that will be generated from KACH's AMIC. This run may be to transport a patient from KACH's AMIC to another medical facility's ER or for admission to another medical facility. The most likely reason for an AMIC transfer is the inability of the AMIC to treat a patient who arrives with symptoms that require an admission or ER-level treatment. AMIC transfers will begin when the ER closes and the AMIC opens (June 1996).

Ward Transfers - The ambulance runs generated from KACH's inpatient wards. These runs are performed to transport a patient from KACH's wards to another medical facility for admission. After the inpatient wards cease to operate (June 1996), there will no longer be ward transfers.

Routine Transports - The ambulance runs that are not in response to a medical emergency. These runs include transporting patients to and from appointments and/or procedures at other medical facilities and transporting non-emergency patients from KACH's clinics/wards/ER to other medical facilities for admission. These runs may be performed in either the ALS units or the PTVs, depending on medical need. After the in-patient wards and ER close (June 1996), KACH will no longer provide routine transports using ambulance section personnel. The shuttle service to and from Walter Reed Army Medical Center and the National Naval Medical Center will be increased in an effort to meet the customers' needs for transportation to medical appointments.

911 with Patient Treatment (Pt Tx) - The ambulance runs generated in response to a medical emergency called into the 911 dispatch center resulting in treatment being rendered to a patient. There are no conditions which should affect (increase or decrease) the amount of ambulance runs in this category.

Fire Standby - The ambulance runs generated in response to a call from the post fire department. Due to certain regulations and standards, ambulances and EMS personnel must be on the scene when the fire department responds to structure fires or to any central alarm. There are no conditions which should affect (increase or decrease) the amount of ambulance runs in this category.

Other/Non-Patient (Pt) - The ambulance runs that are in response to or result in a situation where no patient transport or treatment is rendered. Some examples runs that fall into this category are the run is cancelled enroute, no patient was found at the scene, transporting medical equipment and/or supplies, etc. There are no conditions which should affect (increase or decrease) the amount of ambulance runs in this category.

APPENDIX C

MARYLAND AMBULANCE INFORMATION SYSTEM (Rev. 7/95)

• USE A NO. 2 PENCIL OR A BLUE OR BLACK INK PEN. (NOT RED)
• FILL IN LEADING ZEROS.

CORRECT / INCORRECT

STATION RUN NUMBER | JURISD INCIDENT NUMBER | SUPL | BOX NUMBER | DISTRICT

RECEIVING FACILITY:

OTHER UNITS ON SCENE:

RESPONSE LOCATION:

ZIP CODE | INC TYPE | OCCUP | ACTION | DISP

DATE — MONTH | DAY | YR

2 8 0 3 7 3 0 0

PATIENT NAME:

PARENT/ GUARDIAN:

PATIENT ADDRESS:

HOME PHONE:

PROVIDER 1 ID# | PROVIDER 1 NAME

PROVIDER 2 ID# | PROVIDER 2 NAME

PROVIDER 3 ID# | PROVIDER 3 NAME

DOCUMENTATION OF TIMES

911 CALL | AMB CALL | DPT STA | ARV LOC | DPT LOC | ARV HOS | RTN SER

RESPONSE IDENTIFICATION

CTY | UNIT

HIGHEST STAFFED: EMT-A, IVT, CRT, EMT-P, Other

NO CARE RENDERED: DOA, Cancel, False, No Pt, Refuse, Unit 2

DISPATCH: ALS, BLS

PRIORITY: One, Two, Three, Four, N/A

1st DUE: Yes, No

PATIENT

AGE: M, D, 0, 1 1, 2 2, 3 3, 4 4, 5 5, 6 6, 7 7, 8 8, 9 9

RACE: Black, White, Other

GENDER: Male, Female

CHIEF COMPLAINT:

HISTORY:

ROUTINE MEDICATIONS:

ALLERGIES:

ASSESSMENT/CARE:

FIRST VITALS

SYS	DIA	PULSE	RES
0	0 P	0	0
100	100	100	100
200	200	200	200
10 1	10 1	10 1	10 1
20 2	20 2	20 2	20 2
30 3	30 3	30 3	30 3
40 4	40 4	40 4	40 4
50 5	50 5	50 5	50 5
60 6	60 6	60 6	60 6
70 7	70 7	70 7	70 7
80 8	80 8	80 8	80 8
90 9	90 9	90 9	90 9

LOC PRIOR TO ARRIVAL? Yes / No

GCS: E M V — 1 1 1 / 2 2 2 / 3 3 3 / 4 4 4 / 5 5 / 6

LUNGS: Normal, Wheeze, Rales, L Decrease, R

SIGNS/SYMP

Agitated, Airway Obs, Cyanotic, Dehydrated, Diaphoretic, Hemorrhage, Hypothermic, Laceration, Nausea, Pain: Head, Chest, Neck, Abdmn, Back, Extrm, Paralysis, N Pupils, A, Resp Distrs, Syncope, Vomiting, Weakness, OTHER

ASSESSMENT

INJURY TYPE: ATV Crash, Beating, Bike, Burn, Drowning, Fall, Farm, GSW, Industrial, Lawn Mwr, Motorcycle, MV Crash, Pedestrian, Sport/Rec, Stabbing, Tox Inhal, Venom Bite, OTHER

TRAUMA ID: Shock, Multi Sys, Sev S Sys, Pen Wnd, CNS Inj, Mechanism, Other Fatal, Age

MECHANISMS: Deformity, Ejection, Entrapment, Fall ≥ 15', Speed

SAFETY EQUIP: Not Used, Belt/Harn, Safety Seat, Air Bag, Helmet

CONDITIONS

Allergic Rxn, Asthma, Behavior, Cardiac Arst, CHF, COPD, CVA, Diabetes, DNR, Exposure, GI Disorder, Med. Illness, MI/Cardiac, OB/GYN, Overdose, Poison, Resp Arst, Seizure, OTHER

E.C.G.

F L Nor Sinus, Sinus Tach, A-Fib, SVT, Sinus Brad, Degree, Block 1 2 3, Asystole, EMD, PVC's, Vent Fib, Vent Tach, OTHER

C/A WITNESSED? Yes / No

CPR START: Citizen, 1st Resp, EMS BLS, EMS ALS

TIME :

TREATMENT PROVIDED

AIRWAY (Equipment Used): Orophar, Nasophar, NC, Face Mask, BVM, PPD, Other, LPM

AIRWAY (Establishment): Suction, Laryngoscopy, Mask Assist, Hypervent

CIRCULATION: A IV (S (1st)), A IV (S (2nd order)), A (S EJ), A (S IO)

PROV. 1 2 3

Total cc's: Gage/ Site

CPR, CPR Mech, Cntrl Bld, MAST (leg), MAST (full), MAST (↓)

EOA, ET, NT, NG, NDT, DEFIB, AED, CARDIOV, PACE — A, S, PROV. 1 2 3

ET Size:

Spinal Immob, OB/Delivery, Other, Tract/Splint, Restraints, →

MEDS

	PR1	PR2	PR3
Adenosine			
Albuterol			
Atropine			
Calcium			
Charcoal			
Dextrose			
Diazepam			
Dopamine			
Epi 1:10K			
Epi 1:1K			
Furosemide			
Glucagon			
Lidocaine			
Morphine			
Naloxone			
Nifedipine			
Nitroglycerin			
Na Bicarb			
Terbutaline			

TRANSPORTATION/COMMUNICATION

TRANSPORT BY: No Trans, This Unit, Other-Amb, Other-Heli

TRANS REASON: Closest, Specl Ref, Rrt-Alert, Rrt-Cnslt, Transfer, Routine, Patient

EMS RADIO STATUS: No Attempt, Good, Poor, Failed

CNSL, TRNS

RECV HOSP: 0 0 / 1 1 / 2 2 2 / 3 3 3 / 4 4 4 / 5 5 5 / 6 6 6 / 7 7 7 / 8 8 8 / 9 9 9

SPECIAL PURPOSE: Mul Pat Seen, Mul Pat Trans, Haz Mat, Excep Call, Add Narrative, Fire Rehab.

VAR: A, B, C, D, E

ABG's @ ER (if available): pH, pO2, pCO2, BE (+ / −)

On-Line Physician:

MILEAGE:

PROVIDER SIGNATURE

HOSPITAL SIGNATURE

EMS REVIEWER

EXPOSURE: B, A, O

PROV #	TIME	B.P.	PULSE	RESP.	RHYTHM	PULSE OX (%)	CARE PROVIDED	AMOUNT
	:	/						
	:	/						
	:	/		56				
	:	/						

REQUEST FOR MEDICAL TRANSPORTATION

Routine requests are to be delivered 24 hours prior to appointment.
Fax form to x72373 and retain transmission report.

PATIENT RECORDING CARD

APPOINTMENT DATE AND TIME_____

REQUESTED DEPARTURE TIME_____

REQUESTING CLINIC_____

RECEIVING FACILITY_____

RECEIVING CLINIC_____

PATIENT PRIORITY: (CIRCLE) ROUTINE/URGENT/EMERGENT (SEE REVERSE)

PATIENT TYPE: (CIRCLE) AMBULATORY/WHEELCHAIR/LITTER

ACCOMPANYING PATIENT: (CIRCLE) RECORDS/X-RAYS/MEALS/PERSONNEL_____

DIAGNOSIS_____

CURRENT THERAPY_____

_____

ACCEPTING PHYSICIAN_____ TELEPHONE #_____

PHYSICIAN'S ORDERS_____

_____

_____ TELEPHONE #_____
TRANSFERING PHYSICIAN'S SIGNATURE

PROVIDERS 1._____ 2._____ 3._____ 4._____
RCD CALL_____ DPT STA_____ ARV LOC_____ DPT LOC_____ ARV HOS_____ RTN SER_____
TOTAL MILES____ VEHICLE NUMBER_____ VS: BP P R SaO_2% TIME
NARRATIVE:_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

MEDDAC (FT MEADE) FORM 415 (REV)
13 OCT 95
PREVIOUS EDITIONS ARE OBSOLETE

_____
PROVIDER'S SIGNATURE

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY MEDICAL DEPARTMENT ACTIVITY
2480 LLEWELLYN AVENUE
FORT GEORGE G. MEADE, MARYLAND 20755-5800

REPLY
ATTENTION OF

MEMORANDUM OF AGREEMENT
BETWEEN
COMMANDER, KIMBROUGH AMBULATORY CARE CENTER
AND
COMMANDER, U.S. ARMY GARRISON, FORT GEORGE G. MEADE

1. PURPOSE: To provide an understanding of responsibilities between Commander, Kimbrough Ambulatory Care Center, and Commander, U.S. Army Garrison, Fort Meade, pertaining to the transfer and operational control of the Emergency Medical Services to the Garrison Fire Department.

2. RESPONSIBILITIES:

a. U.S. Army Garrison, Fort George G. Meade will:

(1) Provide space for all Emergency Medical Services, to include equipment, vehicles, and personnel.

(2) Assume full operational control for Emergency Medical Services at Fort Meade, to include all emergent and urgent request (urgent request to Kimbrough's designated facility).

(3) Be responsible for assignment of work schedule for EMS personnel to ensure maximum EMS coverage.

(4) Provide representative to serve on the Kimbrough Ambulatory Care Clinic Clinical Executive Committee to report on staffing, workload, and other issues.

(5) Complete and submit time cards on the seven paramedics to Kimbrough each pay period.

b. Kimbrough Ambulatory Care Clinic will:

(1) Detail seven paramedics to work under the supervision of the Garrison Fire Department Chief or his designate.

(2) Initiate a MACOM to MACOM request to transfer seven paramedic authorizations from the Kimbrough TDA to the Garrison TDA.

(3) In accordance with Medical Commands Regulation 40-5, will have technical supervision (medical oversight) of EMS provided by the Garrison Fire Department.

(4) Budget for personnel cost, training, and supplies. Funding will be provided on monthly basis. The budgeting will be fixed price agreed upon by both parties (it will factor in regular and overtime pay). Any costs above the agreed upon fixed price must be negotiated by both parties.

(5) Sign over EMS equipment (hand receipted) to the Garrison Fire Department Chief or his designate.

(6) Input and certify time cards each pay period on the seven paramedics.

3. Effective date of this agreement is 1 September 1996.

4. Both parties agree to enter into this agreement for a one year period. At the end of one year, either party may terminate the agreement with a minimum of six months notice. Notification of intent to terminate this agreement must be done in writing.

DAVID W. ROBERTS
COL, MC
Commanding

DAVID H. TOOPS
Colonel, Field Artillery
Commanding

REFERENCE LIST

ACLS Subcommittee and the Emergency Cardiac Care Committee, AHA. 1991. Improving survival from sudden cardiac arrest: the "chain of survival" concept. Circulation. 83, no.5 (May): 1832-1847.

Cummins, Richard O., ed. 1994. AHA Textbook of Advanced Cardiac Life Support. Dallas, TX: AHA.

Bourn, Scott. 1994. Measuring response times. Journal of Emergency Medical Services. (November): 31-32.

Committee on Trauma and Committee on Shock. 1966. Accidental death and disability: the neglected disease of modern society. Washington, D.C.: American Medical Association.

Defense Base Closure and Realignment Commission. 1995. Report to the President. Washington, D.C.: GPO.

Department of Defense. 1995. Base Closure and Realignment Report. Washington, D.C.: GPO.

Education Article, The Annotated Code of the Public General Laws of Maryland (1994 Cumulative Supplement). 1994. Charlottesville, VA: The Michie Company Law Publishers.

Emergency Medical Services Division, Department of Health, Education, and Welfare. 1979. Emergency Medical Services Systems Program Guidelines: HSA 79-2002. Washington, D.C.: GPO.

Feero, Stan, Jerris R. Hedges, Erik Simmons, Lisa Irwin. 1995. Does out-of-hospital EMS time affect trauma survival? American Journal of Emergency Medicine. 13, no. 2 (March): 133-135.

Hudson, Neff. 1995. Drawdown about over, force eyes stability. Army Times, 2 January, 8-9.

Health Services Command. 1993. Health Services Command Regulation 40-5: Medical Services Ambulatory Patient Care. San Antonio, Texas.

Ivancevich, John M. and Michael T. Matteson. 1993. Organizational Behavior and Management 3d ed. Boston: Richard D. Irwin, Inc.

Jagoda, Andy and Michael Pietrzak. 1992. Prehospital care and the military. Military Medicine. 157 (January): 11-15.

JCAHO. 1996. Joint Commission for the Accreditation of Health Care Organizations Standards Manual. Chicago: JCAHO.

Kellerman, Arthur L., Bela B. Hackman, Grant Somes, Timothy K. Kreth, and Lindacarol Nail. 1993. Impact of first-responder defibrillation in an urban emergency medical services system. JAMA. 270, no. 14 (13 October): 1708-1713.

Kimbrough Army Community Hospital. 1995. Medical Services Action Plan. Fort Meade, Maryland.

Kuehl, Alexander E., ed. 1994. Prehospital Systems and Medical Oversight. 2d ed. St. Louis, Missouri: Mosby Lifeline.

Maryland State EMS Board. 1995. Maryland EMS Plan. Baltimore, MD.

National Highway Safety Act. 1966. Public Law 89-564. Washington, D.C.

Nelson, Soraya S. 1995. Five hospitals targeted for closing on latest list. Army Times, 13 March: 10-11.

Ornato, Joseph P. 1995. Staffing and equipping EMS systems: rapid identification and treatment of acute myocardial infarction. American Journal of Emergency Medicine. 13, no.1 (January): 58-66.

Peterson, Nancy. 1988. The black and white world of private EMS. Journal of Emergency Medical Services. 13, no. 11 (November): 53-60.

Ruskin, Jeremy N. 1988. Automatic external defibrillators and sudden cardiac death. The New England Journal of Medicine. 319, no. 11 (15 September): 713-715.

Spaite, Daniel W., Terence D. Valenzuela, Harvey W. Meislin, Elizabeth A. Criss, Paul Hinsberg. 1993. Prospective validation of a new model for evaluating emergency medical services systems by in-field observation of specific time intervals in prehospital care. Annals of Emergency Medicine. 22, no. 4 (April): 638-645.

Stout, Jack L. 1987. Measuring response time performance. Journal of Emergency Medical Services. 12, no. 9 (September): 106-110.

Swan, Thomas H. 1988. The dark side. The role of privatization in EMS. Journal of Emergency Medical Services. 13, no. 10 (October): 46-50.

Tice, Jim. 1996. Almanac '96: After five years, the drawdown nears a wrap. Army Times. 1 January: 12-13.